Citizens' Bulletin

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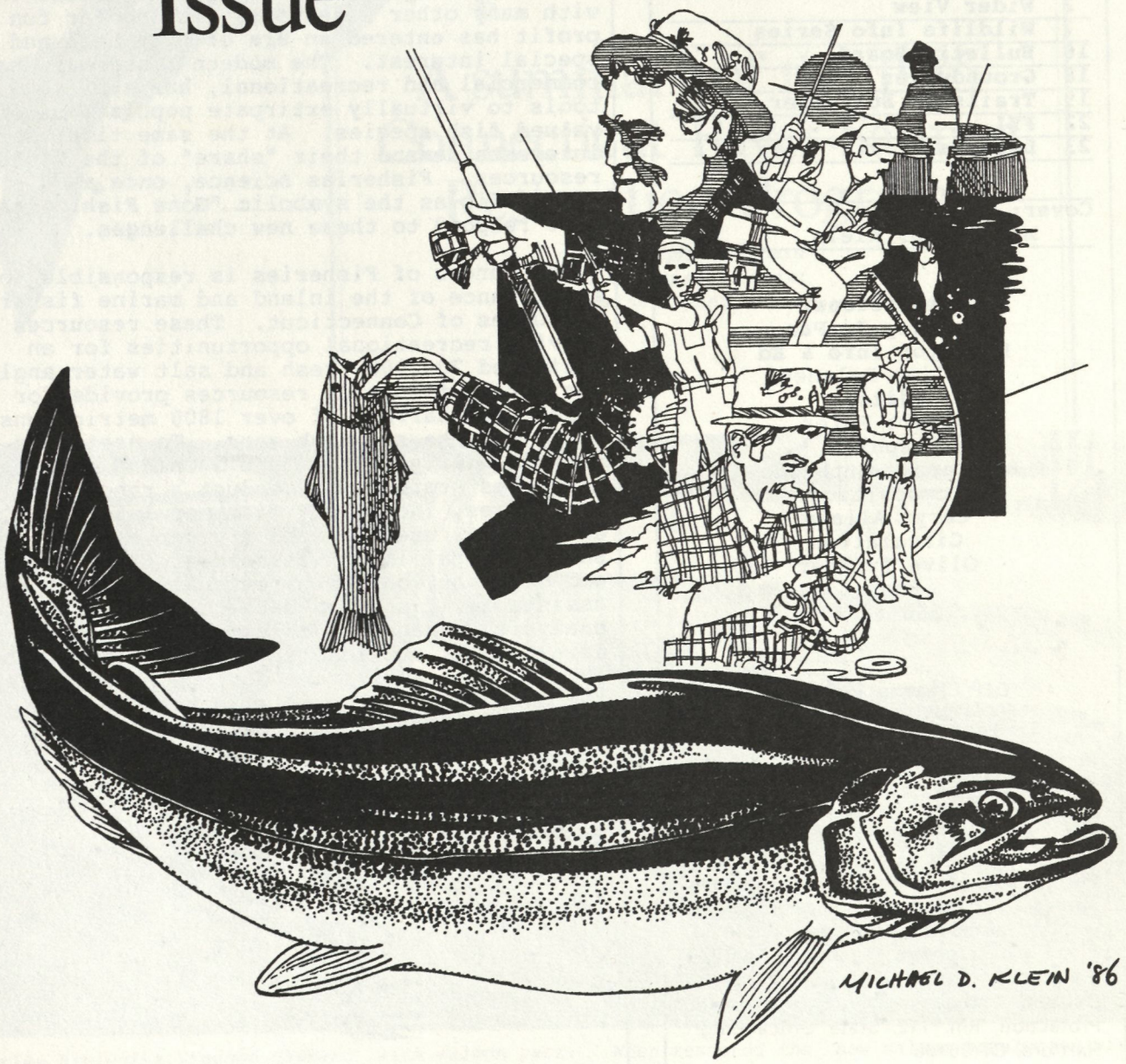
Spring Fishing Issue



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Features

3	**Bringing Back the Salmon** Stephen Gephard
9	**New Fishing Program** Robert Sampson
12	**Heublein Tower** Nancy Grissom
14	**Coverts Project** Nancy Kriz

Departments

2	**Wider View**
7	**Wildlife Info Series**
16	**Bulletin Board**
18	**Groundwater**
19	**Trailside Botanizer**
22	**FYI**
23	**Letters**

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The Wider View

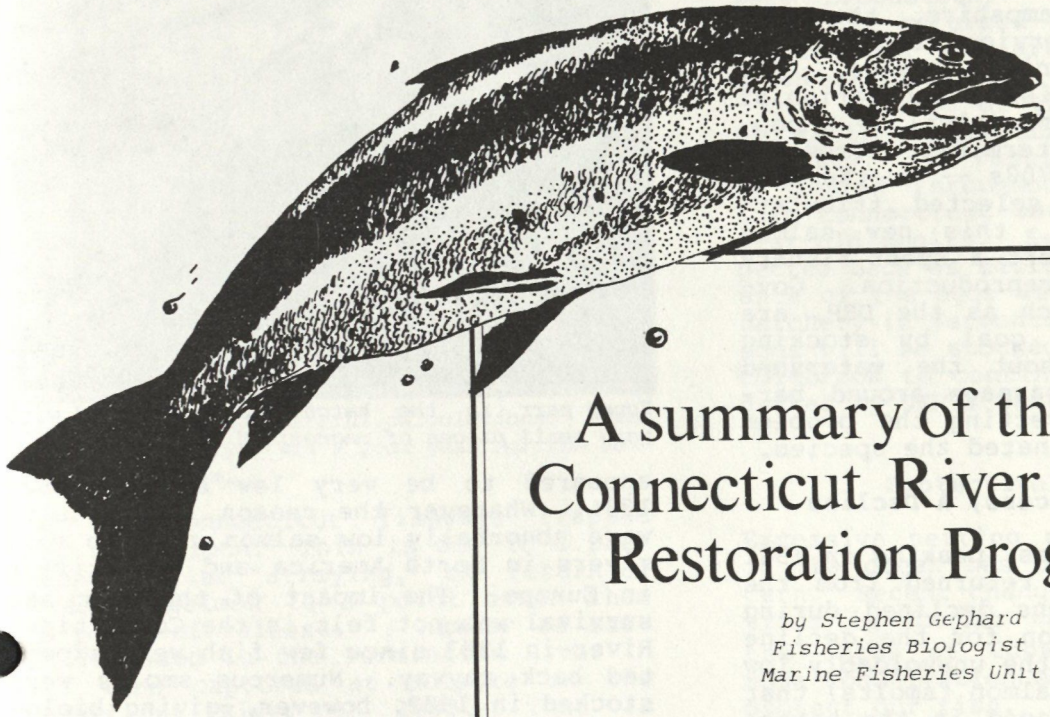
"Gone Fishin'"

by Robert Jones,
Director,
Bureau of Fisheries

A sign of simpler times, "Gone Fishin'" once was a symbol of excused absence and frequently an expression of a seldom-used definition of "to fish: to seek something by circumlocution." Today one wonders whether the inner tranquillity once sought by anglers is still available. As with many other endeavors, fishing for fun and profit has entered an era of high tech and special interest. The modern fisherman, both commercial and recreational, has available the tools to virtually extirpate populations of valued fish species. At the same time, special interests demand their "share" of the fishery resources. Fisheries science, once as simplistic as the symbolic "Gone Fishin'" sign, must respond to these new challenges.

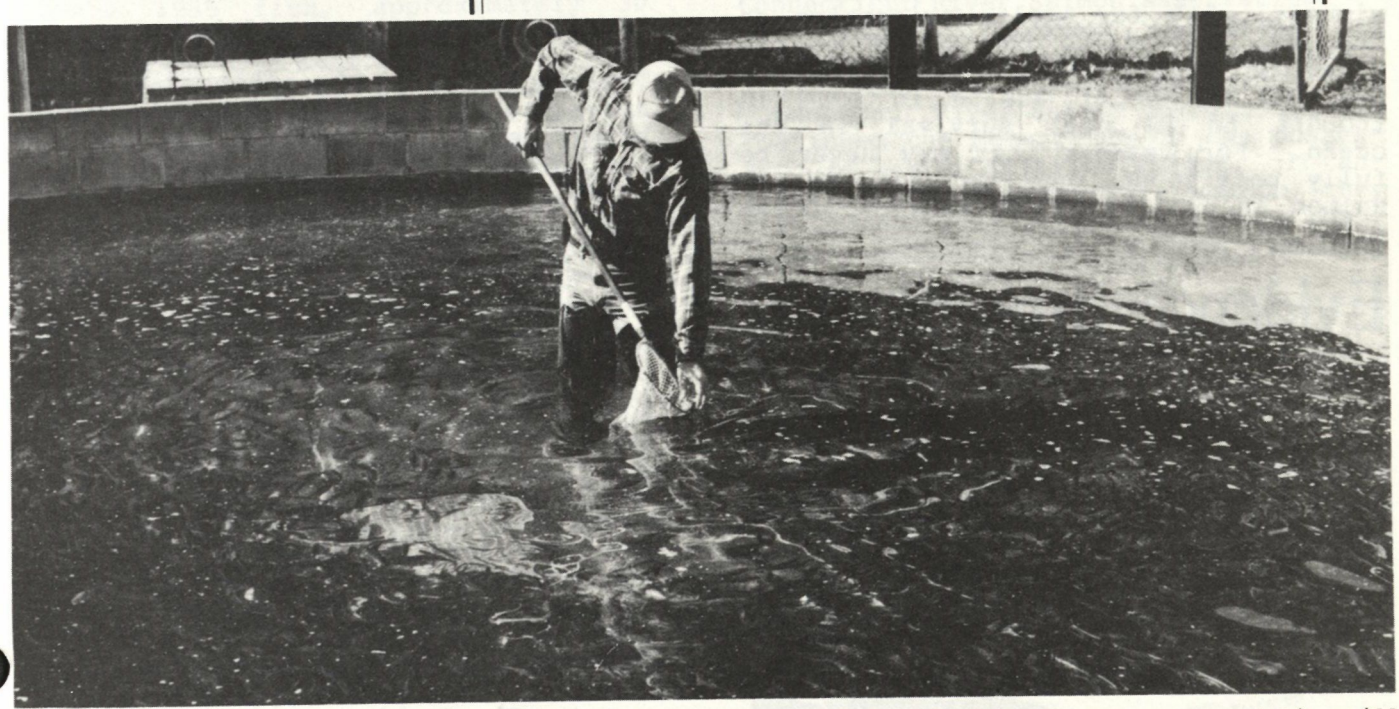
The Bureau of Fisheries is responsible for the maintenance of the inland and marine fisheries resources of Connecticut. These resources provide recreational opportunities for an estimated 700,000 fresh and salt water anglers. Our marine fisheries resources provide for a commercial harvest of over 1800 metric tons of food from the sea each year. To meet this responsibility, the Bureau's Inland and Marine Fisheries staffs must conduct a range of activities, including: fish population assessment, use and economic surveys, environmental impact assessment, fish production and distribution, fish restoration, technical assistance, fisheries data collection and analysis, management-oriented research and development, and aquatic resource education. All of these activities must be balanced against the demands of the special interests, the perceived needs of the resource, and the availability of funds. ■

Bringing Back the Salmon



A summary of the 1985 Connecticut River Salmon Restoration Program

by Stephen Gephard
Fisheries Biologist
Marine Fisheries Unit



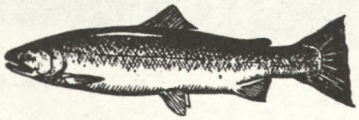
Fisheries Biologist Stephen Gephard with salmon parr: When restored the new salmon population will support a sport fishery as well as natural reproduction. (Photos: Robert Paier)

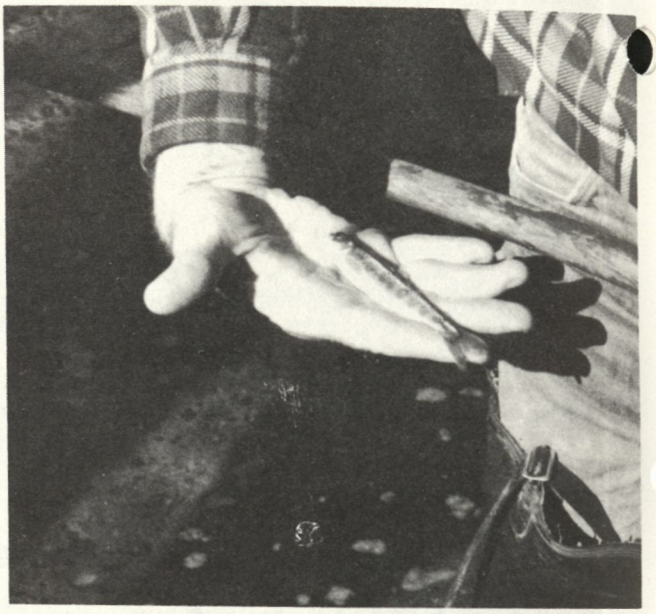
The total number of adult salmon entering the Connecticut River during 1985 was 310. This is the second highest total in the 19-year history of the Connecticut River Atlantic Salmon Restoration Program. The restoration program is a cooperative effort between the states of Connecticut, Massachusetts, Vermont, and New Hampshire, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. The goal is to re-establish a population of Atlantic salmon (Salmo salar) -- a population which was exterminated from the region in the late 1700s -- to the Connecticut River and selected tributaries. When restored, this new salmon population will support a sport fishery as well as natural reproduction. Government agencies, such as the DEP, are working toward this goal by stocking young salmon throughout the watershed and providing fish passage around barrier dams, thus correcting the problem that originally eliminated the species.

After Initial Success, A Decline

After initial successes, peaking in 1981 when 529 adult fish returned from the ocean, the salmon runs declined during 1982-1984. The reason for the decline in 1982 and 1983 was the unavoidably low numbers of juvenile salmon (smolts) that were raised and released in the hatcheries during 1980 and 1981. These low numbers were caused by a disease epidemic during the preceding years. Obviously, with few smolts emigrating to the sea, few adults can return to the river two years later. The reason for the low number of adults in 1984 is thought to be poor survival in the ocean. For reasons that may never be fully understood, the survival of all salmon in the northwest Atlantic Ocean

Evidence from late 1985 indicates that the sea-survival of salmon has continued to improve.





Young parr in the hatcheries are tagged with very small pieces of magnetized wire.

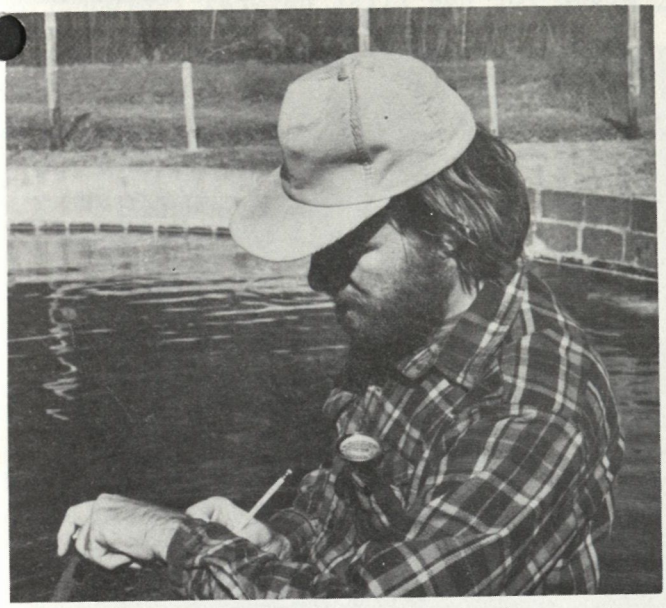
appeared to be very low during 1982-1984. Whatever the reason, the results were abnormally low salmon runs to most rivers in North America and many rivers in Europe. The impact of the poor sea survival was not felt in the Connecticut River in 1983 since few fish were expected back anyway. Numerous smolts were stocked in 1982, however, giving biologists reason to expect larger adult returns in 1984. Nevertheless, oceanic conditions produced disappointing runs.

Improving Conditions

The conditions in the northwest Atlantic appear to be improving. Salmon runs on both sides of the Atlantic improved during 1985, although they were not up to normal, "acceptable" levels. This is true of the 1985 Connecticut River run as well. The 310-fish run meant a 0.15 percent return rate, with an average of 1.5 adults returned in 1985 for every 1,000 smolts that were stocked in 1983. That is much better than the return rates of 1984 and 1983, but considerably lower than the 0.30 percent rate that was achieved in previous years, such as 1981. Circumstantial evidence from the North Atlantic during late 1985 indicated that the sea-survival of salmon has continued to improve, suggesting that 1985 was a transition year between the poor sea survival of 1984 and the hoped-for good sea survival of 1986, which many biologists expect.

The Problem of Straying

Given the relatively high total numbers,



Steve Gephard makes careful calculations: Even with straying, 1985 was a good year for the restoration program.

the two Connecticut fishways trapped very few salmon. This is due to a phenomenon called "straying," the return of an adult salmon to a point other than its point of release. A number of salmon released in the Farmington River in 1983 were captured at Holyoke on the Connecticut River in 1985. That is known because the salmon were carrying coded microtags in their nasal cartilage. Based on incomplete tag analysis of the 1985 fish, approximately 30 "Farmington River fish" strayed to Holyoke. These fish swam past the mouth of the Farmington River in Windsor, over the Enfield dam, and into Massachusetts.

Although one tagged salmon released in the Salmon River was trapped at Holyoke in 1985, it is difficult to assess the degree of straying from the Salmon River since most of its smolts were not tagged. A factor contributing to the low return to the Leesville fishway may have been the questionable health of the 1983 Salmon River smolts. A disease problem with these juvenile salmon may have contributed to higher mortality at sea. This disease problem has not recurred since then, and is not expected to be a major factor in adult returns for the foreseeable future.

Collecting Broodstock

Returning adults are trapped so that they may be artificially spawned in the fall to provide the many eggs needed to fill the hatcheries and continue the program. These broodstock fish are taken to the Whittemore Salmon Station in Barkhamsted, where Connecticut salmon are held, and the Sunderland National Salmon Station in Sunderland, Massachusetts, where the Holyoke salmon are held. At Whittemore, 801,402 eggs were collected from sea-run, domestic, and kelt broodstock. (Kelts are sea-run fish that returned and spawned in previous years and are fed so that they spawn again without going back to sea.)

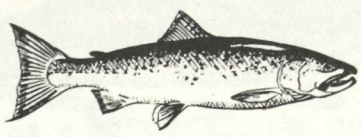
Over 570,000 of these eggs were shipped to the DEP's Kensington State Salmon Hatchery. The resulting young fish will be reared throughout 1986 and stocked into Connecticut waters in 1987 as one-year-old smolts. Survivors would be expected back as adults in 1989. The balance of the eggs were sent to a federal hatchery in Vermont. The fry from these eggs will be stocked into Sandy Brook in Colebrook to continue the research conducted by DEP's Western District personnel.

Protective Regulations

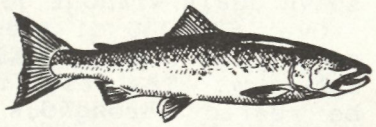
Excessive netting of the salmon stocks in the ocean has been a cause for concern. Recent changes in netting regulations in Canada have probably reduced the catch of Connecticut salmon, but more conservation measures are needed to protect our fish. Many Connecticut citizens are active in the effort to conserve Atlantic salmon in the high seas. Information can be obtained from the Connecticut River Salmon Association.

In order to protect the salmon in freshwater, the state of Connecticut, along with the other four states and Connecticut River Salmon Commission, has continued the moratorium on the possession of adult Atlantic salmon. If anglers accidentally catch a salmon, they must immediately return it to the water without inflicting undue harm. One may

If you catch a salmon, return it immediately to the water.



The stage is being set for the first natural reproduction of salmon since the 1790s.

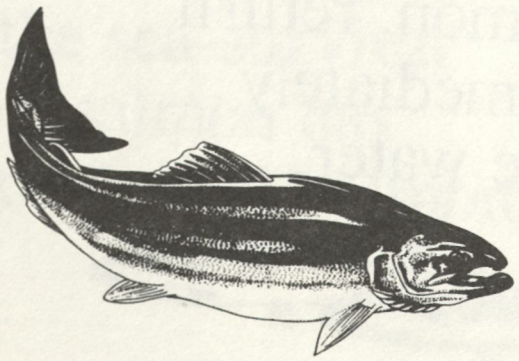


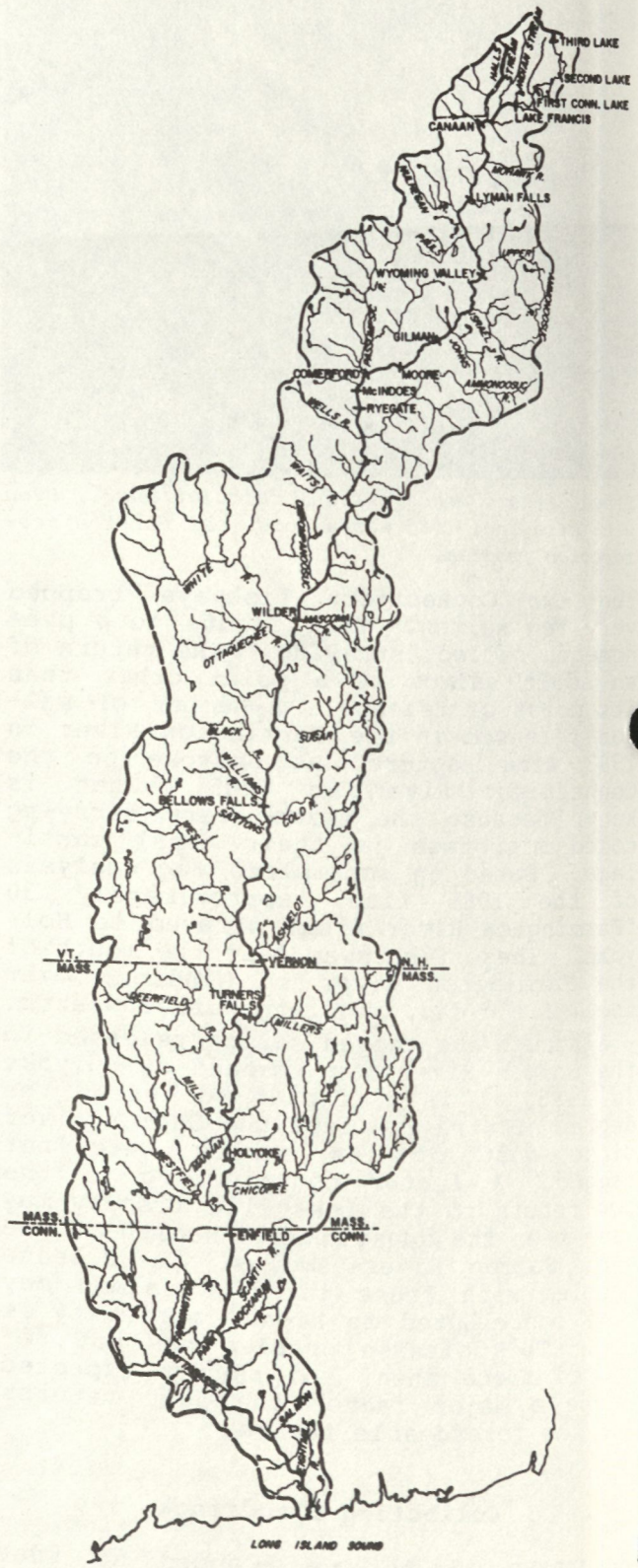
not possess even a dead salmon. If you find a dead salmon, leave it where it is and call the DEP at 566-3333. Also it is illegal to keep any young salmon.

Obviously, if we are to have an adult salmon run, the young salmon must reach the sea. There now are numerous streams in the Farmington River and Salmon River watersheds that have year-round populations of juvenile salmon. Since most of these juveniles are not yet silver, they can be difficult to distinguish from trout. Therefore, the DEP has instituted a nine-inch minimum limit for trout in these streams. Juvenile salmon are always shorter than nine inches and only trout longer than nine inches are being stocked into these streams. To learn which streams have this nine-inch regulation, consult the summary of fishing laws, available when you get your license.

Looking Ahead

1985 was a good year for the program to restore our region's salmon, even if straying stole some of the excitement from Connecticut streams. It appears that in the future, 1985 will be seen as a big step in the improving adult returns that will occur during the late 1980s. The expected strong runs during the rest of this decade will set the stage for the first natural reproduction of salmon since the 1790s and, sometime thereafter, a sport fishery for salmon in our state. ■





CONNECTICUT RIVER BASIN

A non-aggressive animal, the opossum readily retreats to available cover when pursued. (Photos: Leonard Lee Rue III)

The Opossum in Connecticut

Not what you'd call beautiful, but a great personality

The opossum (Didelphis virginianus) is the only member of the order Marsupialia (pouched animals) found in Connecticut. The opossum is a non-hibernator, but will usually "hole up" during cold, adverse weather. In Connecticut, the opossum suffers from frostbite and may be missing the tips of its ear or tail.

The opossum is a medium-sized (15 to 20 inches without the tail), primitive animal with long, coarse, grayish-white fur. Black, brown, and albino opossums have been found, but are very uncommon. It has a sharp-pointed and slender muzzle, prominent, thin ears, and short legs. A long (nine to 20 inches), scaly, scatily-haired prehensile tail enables it to hang from trees for short periods or transport leaves to potential nest sites. The opossum has five toes on each foot. The first toe on each hind foot is a divergent, clawless, thumblike, grasping toe. Both sexes are similar, although males are commonly larger in size.

The opossum possesses orange eyeshine. When frightened, it will bare the teeth, hiss or growl, and frequently drool saliva. Being non-aggressive, the opossum readily retreats to trees, brush piles, or other available cover when pursued by man or predators. A common defense mechanism is feigning death -- playing 'possum -- when cornered. The oposum is a very strong swimmer and will take to shallow water when necessary.

Habits

As a marsupial, the opossum

has the most primitive reproductive strategy of any animal in North America.

In Connecticut, breeding usually begins in early March. One or two litters are produced each year. The average litter size is nine, with the young born blind and altricial (helpless). The young weigh in at 0.0046 oz., and are so tiny that nine individuals would fill up half a teaspoon. The blind embryos crawl at least three inches to their mother's pouch, attach themselves to a teat, and remain "locked" on to it for approximately 60 days. After 80 days, young opossums are weaned, leave the pouch, and typically can be seen riding around on their mother's back. By 100 days, they usually are independent. The opossum reaches sexual maturity and may breed during the first year of life.

The opossum inhabits woodland areas along streams, ponds, lakes, swamps, or marhses. Farmland and woodlots are preferred over extensively forested areas.

Shelter is found in abandoned den sites of other animals or cavities in den trees, trash heaps, rock piles, or brush brush piles. Buildings may also be used.

The opossum is both a scavenger and an omnivore, feeding primarily at night. Its diet consists mainly of insects, carrion, reptiles, amphibians, birds and their eggs, crustaceans, worms, grubs, berries, fruits, cereal grains, and small mammals.

Management of Nuisances

Probably due to its musky odor, the opossum seems to be avoided by predators. Occasionally an opossum will fall prey to a dog, fox, bobcat, large hawk, or owl.

The opossum will sometimes cause problems such as raiding poultry yards, eating limited amounts of corn (in the milk stage), or simply getting into gardens where they will feed on vegetables, apples, grapes, and strawberries.

Two measures may be employed to control unwanted opossums. Opossums may be prevented by properly maintaining poultry yards and houses. Gardens should be electric-fenced against opossums and other hungry animals. Another method is by live-trapping. Set a trap (nine by nine by 32 inches) where the animal frequents and bait it with fish, apples, or canned cat or dog food. If there is a chance of catching a skunk, cover the tap with burlap so the animal can be handled safely. Trapped animals should be transported to suitable habitat, at least five miles away.

References and Further Reading

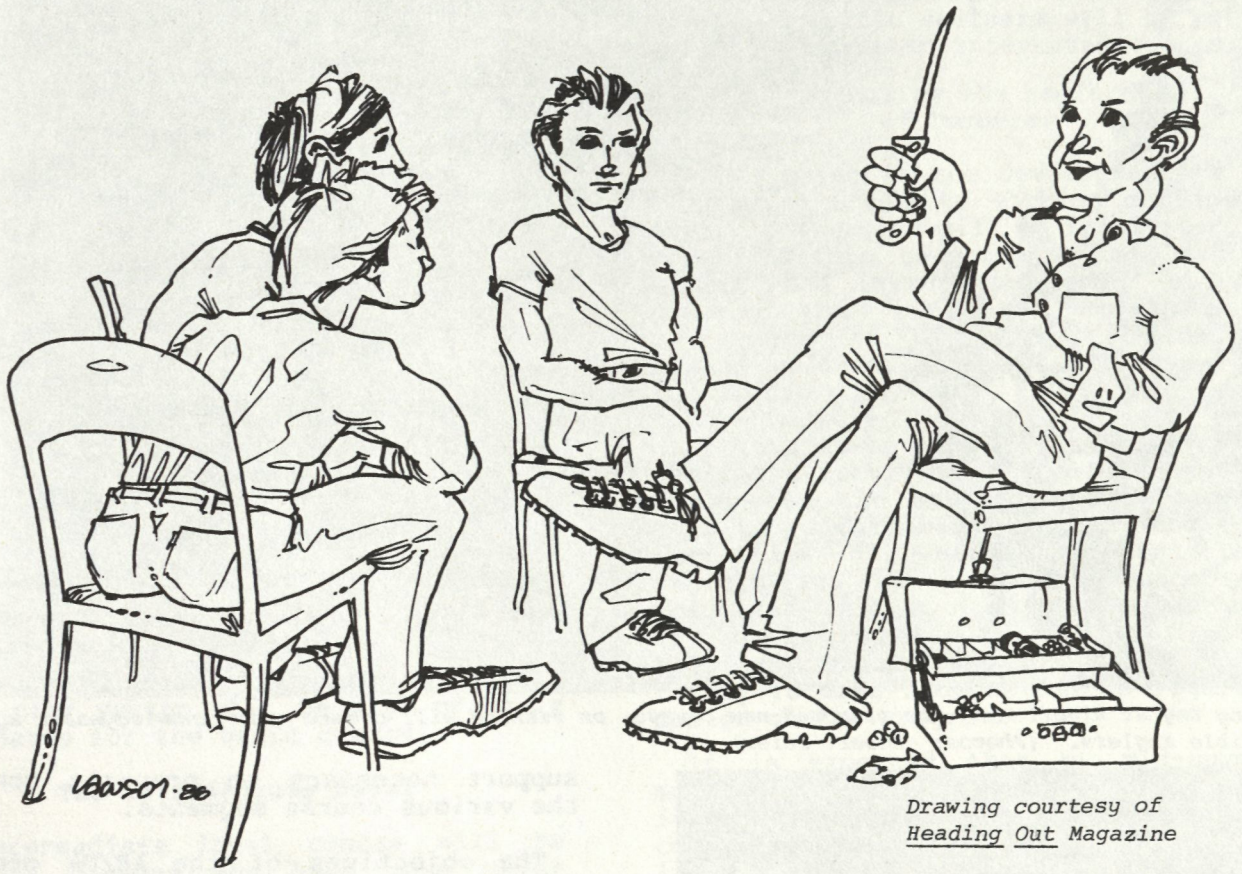
J.W. Caslick and D.J. Decker, 1981. "Control of Wildlife Damage in the Home and Garden." Cornell Univ. Coop. Ext. Booklet.

F. Keefe, 1967. The World of the Opossum. Lippincott, Philadelphia.

The Technical Assistance Informational Series is 75 percent funded by Federal Aid to Wildlife Restoration -- the Pittman-Robertson (P-R) Program. The P-R Program provides funding through an excise tax on the sale of sporting firearms, ammunition, and archery equipment. The remaining 25 percent of th funding is matched by the Connecticut Wildlife Bureau.

Young opossums are weaned after 80 days, and typically can be seen riding around on their mother's back.

If you're a beginner or an expert, this new program will have something for you.



Drawing courtesy of Heading Out Magazine

Aquatic Resource Education in Connecticut

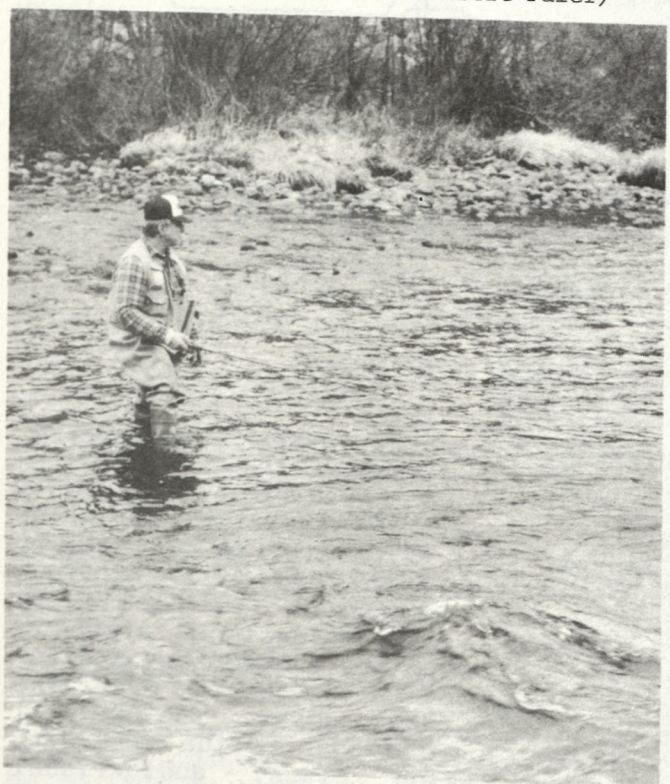
by Robert Sampson, Fisheries Biologist, Bureau of Fisheries

Through the efforts of the Connecticut Sportsman's Alliance, the 1985 Legislative session enacted Public Act 85-570, which appropriated funds to initiate an Aquatic Education/Urban Angler (AE/UA) Program in Connecticut. The funds provided by this act will be used to develop the program which will eventually be funded through the Wallop-Breaux/Dingell-Johnson Expansion Program.

A Network of Volunteer Instructors

We are currently in the early stages of developing and designing this program. It is intended that the AE/UA program be a parallel to the Wildlife Bureau's Hunter Safety Conservation Education Program. The AE/UA program will not be mandatory, however, and will therefore have to be promoted on its own merits. The program will be designed around a network of volunteer instructors and facilities throughout the state, much like the hunter safety program. The DEP will train instructors and provide them with complete lesson plans, audio/visual equipment, slides, and other training aids, in addition to all administrative

Opening Day at Riverton: The proposed new course on fishing will create more knowledgeable and responsible anglers. (Photos: Robert Paier)



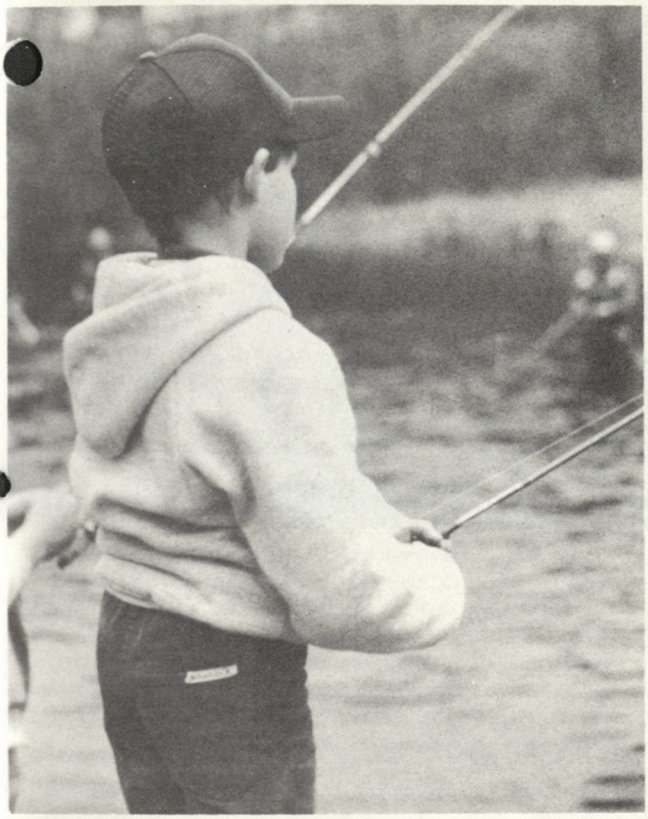
Volunteer instructors are now being sought for all levels.

support necessary to properly conduct the various course segments.

The objectives of the AE/UA program will be to: 1) improve public knowledge of aquatic ecosystems, basic fisheries biology, and fisheries management activities; 2) teach fishing basics, angling ethics, and enhance the intangible aspects of sport fishing through education; and 3) create a better-informed fishing public which will ultimately serve to reduce law enforcement problems in all aspects of fishing and other aquatic-oriented activities.

The Beginning Level

The program content will be designed to meet the educational needs of the fishing public from rank beginners to experts. Course work will be broken into three teaching levels. The basic segment, for the beginning angler, will contain basic elements of aquatic ecology, conservation, fishing tackle, and techniques, fishing and boating safety, and angling ethics. The basic level course will be designed for presentation to youths and others with little or no



The program will educate the anglers and outdoorsmen of the future.

knowledge of fishing. Urban area and inner city youths will be high priority candidates for the basic course.

The Intermediate Level

An intermediate level course will be open to persons who have some prior fishing experience, either in the field or through the basic course, and will be targeted toward older and more experienced individuals. Intermediate course material will skip the fishing basics and delve into fish biology and behavior, ecology, basic fisheries management, safety, regulations and law enforcement, and fishing tackle and techniques at a more advanced and intensive level. It is anticipated that the basic and intermediate courses will be eight to 12 hours in duration.

The Expert Level

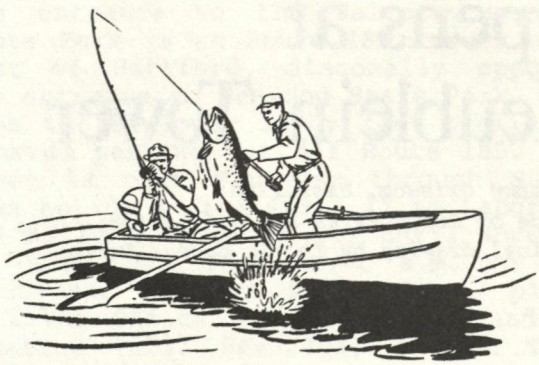
For the experienced fisherman, there will be a series of advanced seminars which will cover a wide variety of subjects. This portion of the program should be of most interest to the organized sportmen's groups throughout the state. These seminar sessions will be designed to be presented in one- to two-hour packages at regular group functions and meetings. Advanced seminars may cover specific topics such as limnology, ecology, fish behavior, fish anatomy, acid rain, lake eutrophication, stream and lake management, advanced fisheries management, and specialized angling techniques. These seminars will be maintained in library fashion and can be expanded or deleted with changing times. Specific seminars will be available on request to interested groups.

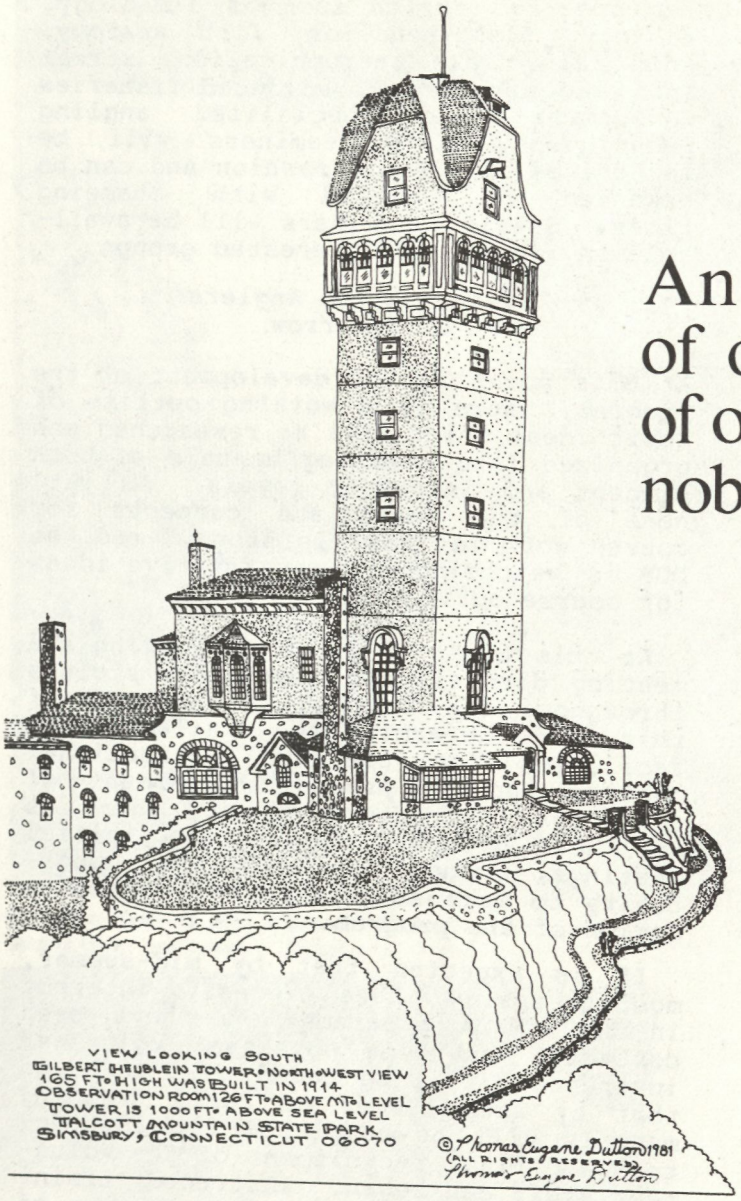
Educating the Anglers of Tomorrow

At this point in the development of the program, there is a working outline of topic ideas which will be researched and organized into teaching manuals at both student and intructor levels. As yet, none of the ideas and concepts for course work is "cast in stone," and the DEP is welcoming any constructive ideas for course outlines.

At this time, AE/UA is contacting and meeting directly with sportsmen's clubs throughout the state. The purpose of this is to determine the availablity of facilities for use as instructional centers and to assess the amount of volunteer instructor interest there is in these groups. During the initial meetings, groups are given the opportunity to make suggestions in regard to design of the program.

It is expected that by mid-summer, most groups who have expressed interest in the AE/UA programs will have been contacted and some potential volunteer instructors will be named. It is hoped that by late summer or fall, training manuals will be completed for instructors and final recruitment of the volunteer staff can begin. Instructor training will take place over the winter of 1986/87. It is intended that the program be open to the public in the early spring of 1987 and that the very important job of educating the state's youth, the anglers and outdoorsmen of the future, can begin. ■





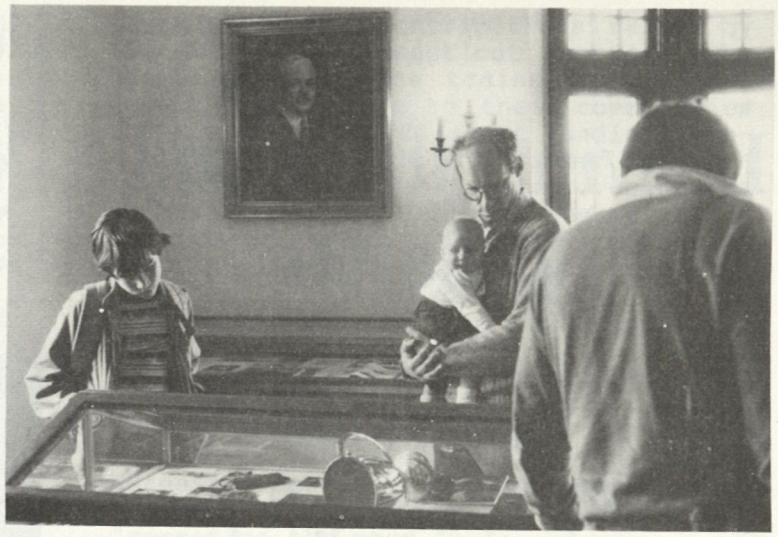
An inside view of one of our state's noblest landmarks

A New Museum Opens at Heublein Tower

By Nancy Grissom, Historian,
Office of State Parks and Recreation
Original drawing by Thomas Eugene Dutton

Heublein Tower, in Talcott Mountain State Park, was first opened to the public as an observation tower in 1974. At that time, few realized the great historical significance of the Tower, or of the surrounding area of King Philip's ridge. The large room near the entrance, the room which had in other times been the Heublein living room, was closed to the public. Visitors were only able to see the foyer and staircase outside -- the oak paneling and the cathedral ceiling within could not be seen.

When this room was opened to the public, with displays acquired from the Heublein Corporation, the curiousity of visitors was aroused. Gradually, with the generous help of visitors and family members, the rich history of the Tower began to emerge. Research revealed records of the many distinquished visitors of Gilbert Heublein and Francis S. Murphy, former owners of the present tower. These have included Dwight D.



Top left: Historian Nancy Grissom and part of the Tower's view of Connecticut, Massachusetts, New York, and New Hampshire; Top right: Gilbert Heublein seems pleased with visitors to the new museum; Bottom right: Another view of the museum and the new mahogany glass display cases. (Photos: Robert Paier)

Eisenhower and the then-president of the Screen Actor's Guild, Ronald Reagan.

Although Gilbert Heublein was a man of distinction in his time, few details of his life have been documented. Family members contributed both information and items, as well as fascinating photographs from the time of the Tower's heyday. The next logical step seemed to be the establishment of a museum.

Six mahogany display cases were obtained. The family room was restored and repainted, and three brass chandeliers from the same era were discovered in the attic of the Old State House and added to the Tower's new museum. Flowers were brought in and transplanted, and the spacious grounds flourished once again, just as they had done in the '30s.

The elegance of the Tower was being restored. Visitors returned many times. A foundation, "The Friends of Heublein Tower," was established in 1984, through which corporate donations may be made toward the Tower's enhancement.

The Tower's architects, Smith and Bassettt, said at one point that "the Tower will stand forever." Anyone who has visited Heublein Tower, who has experienced its spectular view of four states, will certainly hope they are right.

The entrance to the Talcott Mountain State Park is on Route 185, seven miles west of Hartford, diagonally opposite the entrance to Penwood State Park. Access to the Tower is by foot trail from a paved parking lot off Route 185. The Tower is open Thursday through Sunday plus holidays from April 17 to Labor Day and daily from Labor Day until November 2. Hours are from 10:00 a.m. to 5:00 p.m. For further information, please call the Office of State Parks and Recreation (203) 566-2304, or the Tower (203) 677-0662. ■

Leaving the Land a Little Better

Coverts Project helps to preserve Connecticut's woodlands

by Nancy Kriz

Land is, perhaps, "the only thing in the world that lasts." We used to envision it as an inexhaustible resource.

In Connecticut, land is being developed at an incredible rate. During the "boom" period from 1951 to 1971, some 150,000 acres of Connecticut woodland were converted and developed for industrial, commercial, housing, or other purposes.

There are ways to put a halt to, or at least slow down, the rate at which open spaces are diminishing. Avenues for land preservation have been established and continue to be enlarged, updated, and funded by both state and federal agencies and by the private sector. Directly involved in land preservation are the DEP's Land Aquisition Unit, the Department of Agriculture's Farmland Preservation Program, The Nature Conservancy, and the approximately 83 land trusts in existence in the state.

It has become clear that the "market value" of undeveloped land far exceeds its current use value. What does this mean to the owner of a five- to 100-acre parcel of wooded land?

Sound Management and the Philosophy of Stewardship

The Coverts Project, an effort initiated by the University of Connecticut Cooperative Extension Service and the Ruffed Grouse Society, is attempting to address this and other questions. It is based on sound forestland management practices and the philosophy of stewardship.

The Coverts Project is based on sound forestland management and the philosophy of stewardship.

"It is a good feeling," wrote British novelist Anthony Trollope, "to know that you stand on your own ground." Most landowners feel this way. They also realize that the land is not theirs forever and that, in fact, they are simply temporary stewards. Stewardship entails taking care of that land.

Dwight D. Eisenhower was once asked what he felt was his greatest accomplishment. It was assumed it would be something Ike had done during the war or during his presidency. Eisenhower stated that his only goal in life had been "to leave a piece of land better than he found it." He felt he had accomplished this on his farm in Gettysburg.

Landowners generally feel this same sense of protectiveness and responsibility for their land. Many, however, do not know exactly how to go about realizing it. There are different ideas about what "better" means. There are often significant economic factors involved in holding on to a piece of land, from taxes to upkeep to personal financial priorities.

The ownership of forested land in Connecticut is broken down as follows:

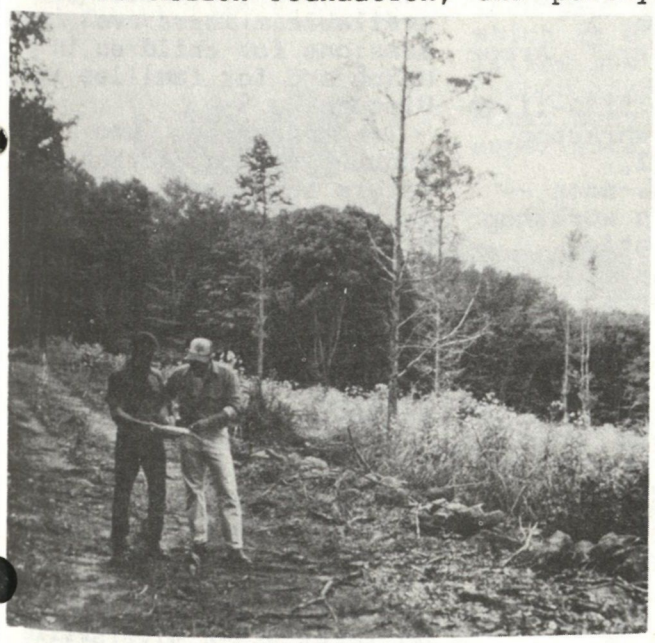
eight percent, state-owned; 10 percent, water companies (quasi-public); and 82 percent, privately-owned (1.5 million acres). The Coverts Project was established to combine the ideas and ideals of stewardship with the practicalities of sound forestland managment in conjunction with wildlife habitat improvement ojectives. Two sister Coverts Projects are currently under way -- one in Vermont, and one here in Connecticut. These may well serve as pilot programs for adoption by other states.

Spreading the Word

The Connecticut program began this summer. Thirty participants were selected, representing 22 towns east of the Connecticut River. Initial in-depth classroom sessions were held at the University of Connecticut in Storrs. The program culminated in a full weekend of field work which took place on a privately owned and managed 100-acre certified tree farm tract in Lyme, and in the Yale Forest in Union.

The director of the program was Extension Forester Stephen Broderick. Instructors included Lee Alexander and David B. Kittredge Jr., of Yale; Dr. John Barclay, Wildlife Biologist, University of Connecticut; Dr. William Healy, Wildlife Biologist, U.S. Forest Service; and James Parda, Forester, Connecticut Bureau of Forestry.

The Coverts Project's educational experience was provided free of charge. All costs were covered by the Ruffed Grouse Society, partly through a grant from the Mellon Foundation, and partly through private contributions raised by the Society's Connecticut chapter. The hitch was that the trainees were then expected to return to their communities to "spread the word" about woodland management -- to teach that timber harvesting and wildlife habitat improvement can go hand in hand. Each trainee maintains an updated set of reference materials and can direct landowners with forestry- or wildlife-related questions to the appropriate source of professional assistance.



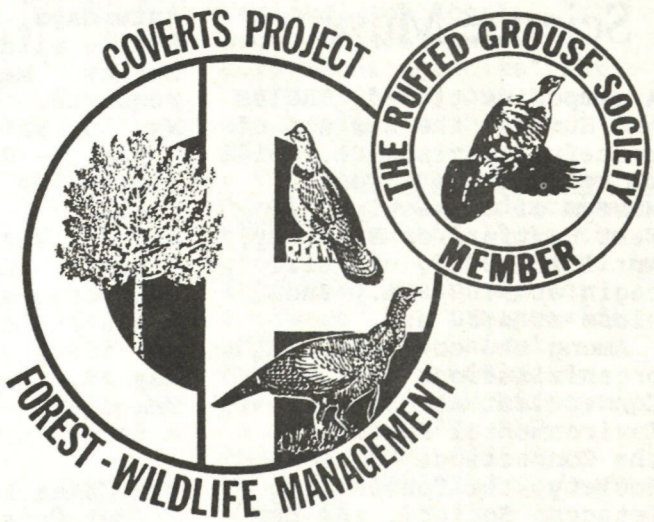
Landowners generally feel a sense of protectiveness and responsibility for their land.

(It perhaps should be noted here that the Coverts Project is similar to the "Master Gardener" Program, also administered by the University of Connecticut Extension Service. Both prgrams involve the same basic concepts of learning and "spreading the word.")

Proper and profitable use of Connecticut's privately-owned woodlands may be the most important tool for insuring their preservation. The Coverts Project's message is that timber harvesting can be done in an environmentally acceptable manner, that wildlife populations can be enhanced, and that the landowner can glean financial rewards while creating healthy, productive forests for Connecticut's future.

Upcoming Sessions

The Coverts Project will be offered again next fall to residents of towns west of the River. The teaching sessions will take place at the Yale Forestry Camp in Norfolk and in forests in Salisbury and New Fairfield. For futher information, please contact Stephen Broderick, Extension Forester, Windham County Extension Center, Wolf Den Road, Brooklyn, CT 06234, phone 774-9600, or the Ruffed Grouse Society, 1400 Lee Drive, Coraopolis, PA 05108. ■



Charter Oak Pass Revised

Dennis P. DeCarli, Deputy Commissioner of the DEP, announced a revised program to provide passes to state parks and recreation areas.

Passes now available are the Charter Oak Pass, for Connecticut senior citizens 60 years of age or older, and the Recreation Season Pass, for all other Connecticut residents.

The age limit for the Charter Oak Pass has been dropped from 62 to 60, and is now valid for Gillette Castle and for fishing at the Quinebaug Valley Hatchery Ponds. The charge is $5.00.

The Recreation Season Pass may only be used for vehicular admission, and the fee is $20.00.

For further information, write DEP, State Parks and Recreation, 165 Capital Ave., Hartford 06106, or phone 566-2304. ■

Whale Symposium at Science Museum

A symposium titled "Whales and Humans: the new era of peaceful coexistence," will be held at the Science Museum of Connecticut in West Hartford on Saturday, April 26, 1986. It will begin at 9:00 a.m., and close at 4:30 p.m.

Among the co-sponsoring organizizations are Connecticut Association of Environmental Educators, the Connecticut Audubon Society, the Connecticut Cetacean Society, the DEP, and others. The program is specifically designed to interest high school and college biology students and their teachers.

Registration, which includes lunch, is $5.00 for adults, and $3.00 for children. For further information, please contact R.L. Bilodeau, Science Museum of Connecticut, 950 Trout Brook Drive, West Hartford 06119. ■

Upcoming Events at Goodwin State Forest

The following events are scheduled for Goodwin State Forest Conservation Center:

April 26, Saturday, 1 p.m. -- Wildflower hunt: search for earliest spring wildflowers.
April 27, Sunday, 2 p.m. -- "The American Elm: A Resurrection Story." Arbor Day Program.
May 3, Saturday, 9:30-11:30 a.m. -- Pruning workshop.
May 3, 10, 17, 31, Saturdays, 9 a.m.-noon -- Edible wild foods workshop series. Registration required. 429-3074.
May 10, Saturday, 10 a.m. - 3 p.m. -- Open house and dedication of new habitat trail.
May 17, Saturday, 10 a.m. - 2 p.m. -- Canoe clinic, with canoes provided. Registration required. 455-9534.
May 25, Sunday, 1 p.m. -- Memorials along the trail: a three- to four-mile hike.

The James L. Goodwin State Forest Conservation Center is located just off Rt. 6 in Hampton, about 10 miles east of Willimantic. For further information, write Lois Kelly, Conservation Center, Rt. 1, Box 100, N. Windham, CT 06256, or phone 455-9534. ■

Audubon Camps

The National Audubon Society's camps celebrate their 50th summer season this year, offering both children and adults a unique approach to learning about wilderness and ecology.

Camps in Maine, Wisconsin, Wyoming, and Connecticut offer programs in backpacking, nature photography, wilderness research, a family program, and a youth ecology camp. Studies range from geology and marine life, to birds, mammals, insects, astronomy, and renewable energy.

Camp sessions for adults run for one or two weeks; costs are from $395 to $650. College credit is available. There are sessions for children in Maine and for families in Wisconsin.

In Connecticut, the Audubon Ecology Workshop offers sessions in introductory field ecology, with special sessions for educators. Campers hike on Audubon's 485-acre nature sanctuary in Greenwich, exploring deciduous and hemlock forests, meadows, lakes, ponds, and streams, and ecosystems on Long Island Sound.

The sessions will be offered from June through September. For further information, write Camps Registrar, National Audubon Society, 613-K Riversville Road, Greenwich, CT 06830, or phone 203-869-2017. ■

It's Time to "Meet the Moose"

by Leonard Lang

Meet the Moose. By Leonard Lee Rue III with William Owen 1985. Dodd, Mead & Companies, 78 pp., $8.95, hardcover.

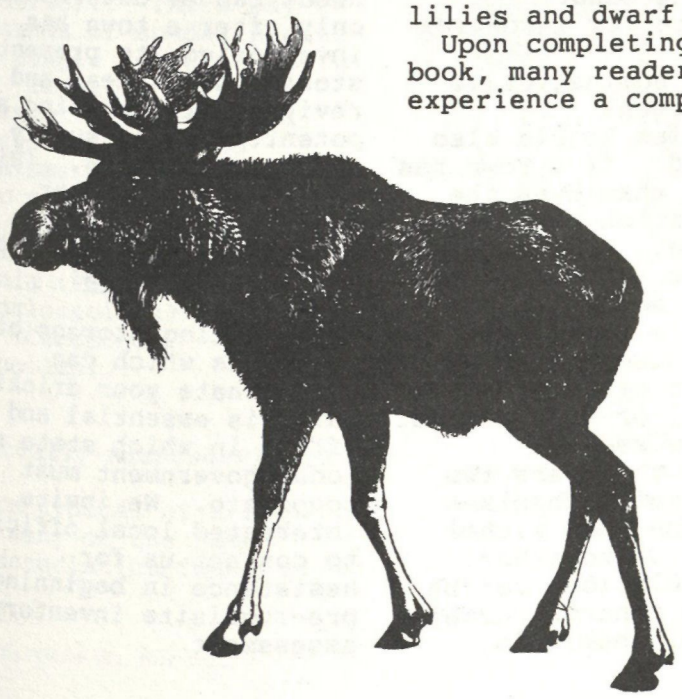
Have you ever wondered how many moose there are in the United States? Or, what that fuzzy piece under a moose's chin is called? If you have, then you should "meet the moose." Meet the Moose is a new, easy-reading book by Leonard Lee Rue III, noted wildlife author and photographer, whose work often appears in the pages of the Citizens' Bulletin. Rue, along with co-author William Owen, brings you face to face with one of America's most impressive beasts.

Meet the Moose, with its close-up images and lively text, reflects a personal feel for the animals. The author presents some startling information: a tiny worm about as thick as a human hair can cause moose sickness, which is always fatal; a male moose can weigh up to 1800 pounds; a cow moose with a calf is more dangerous than a male.

Rue has certainly done his research, including counting the number of teeth in the adult of the species -- there are 32. The authors have obtained their facts through personal experiences and relate them in an exciting story-telling style. What makes this 78-page book even more enjoyable are the photographs. Rue is right on top of the action, whether it is two bulls fighting for a mate or a cow protecting her calves. There are photos of moose running, swimming, shedding velvet from their antlers, and, of course, eating -- a favorite pastime of moose.

Rue has noted that an adult moose will consume 40-50 pounds of food per day in winter, and 50-60 pounds per day in summer. That is between 1200 and 1800 pounds per month, which is a lot of water lilies and dwarf willows.

Upon completing this book, many readers may experience a compelling desire to seek out a moose. According to Rue, best spots for that in New England are Maine and New Hampshire. If you can't get to either of those places, then Meet the Moose is your next best bet. ■



Leonard Lang is a professional photographer and admirer of moose.

Farmland Directory

Preserving farmland and protecting agriculture in fast-developing suburban-rural areas in the Northeast are the goals of a leading environmental group's newly published Farmland Preservation Directory - Northeastern U.S.

Prepared by the Natural Resources Defense Council, Inc., the directory cites a variety of farming, marketing, tax, and conservation strategies that concerned farmers and other land owners can pursue to improve the economic potential of their land while keeping it in active agricultural use. The directory lists more than 160 national, regional, or local organizations and government agencies that can help carry out these strategies in the Northeast.

The Farmland Preservation Directory, which describes the options and lists the groups able to help out, is supported by a computer database that can provide additional technical resource information to purchasers. The Directory is available for $12 (postage included) from NRDC, 122 E. 42nd St., NY, NY 10168. ■

Local Regulation of Hazardous Material Storage

Step I: Inventory and Assessment

Jim Murphy,
Principal Environmental Analyst,
Water Compliance Unit

and

John Cimochowski,
Senior Environmental Analyst,
Local Assistance and Program Coordination

As noted in previous articles in this series, there are many potential groundwater contamination sources, and several methods to control them. This article will discuss this further.

The DEP now regulates the storage of buried fuel oil tanks. At this time, this control is limited because it does not cover the following: chemical liquids not classified as oil or petrolium (such as buried tanks for industrial process chemicals); buried residental heating oil tanks of any size (such as those at single and multi-family dwellings); buried non-residential tanks less than 2100 gallons used for on-site heating or power production (such as those at schools, churches, office buildings) where not for resale or for waste oil storage; and of residual fuels (viscous liquids which do not flow at temperatures less than 60 degrees (such as #6 bunker oil). Though above ground tanks are not yet fully controlled by the state, regulations are being prepared to do so.

Many communities have expressed interest in adopting a local ordinance to regulate the storage of all hazardous materials, from heating oil to industrial chemicals, below or above ground. The DEP is aware of that interest and will soon be drafting guidelines for communities to develop these controls.

Rather than recommend a "model ordinance," the DEP urges communities fo first fully understand the limits of existing and potential state and federal storage tank programs. We do recommend that a community inventory the types of storage tanks now in town, the materials stored, their location, and whether the tanks are above or below ground. With a review of existing and potential commercial, industrial, residential, and institutional land uses, present and future storage uses should be easily determined. This is a basic and necessary pre-requsite for a control program.

Existing adminstrative and enforcement capablilities should also be examined. If a town has few staff, then even the best regulation may prove ineffective. Depending on the type of contol eventually adopted, the service of a building inspector, zoning enforcement officer, sanitarian, or fire marshal may be required.

Finally, there are two basic control mechanisms which can be used either separately or together. Zoning regulations can be written to control certain tank types, chemicals, types of storage (above or below ground), or in what parts of a town any storage tank should be banned (over major groundwater sources). It is important to recognize zoning regulations are prospective -- they regulate activities which will occur only in the future. An ordinance, however, can be retrospective -- its concern may not only be with the present and future, but also with the past. It is expected that most communities will require an ordinance.

The specific control needs can be determined only after a town has inventoried its present storage practices, and has reviewed its existing and potential water supply sources and needs. (Hint: Use the "Groundwater Protection Planning Process," outlined in the February Citizens' Bulletin.)

Regulating storage of materials which can contaminate your drinking water is essential and an effort in which state and local government must cooperate. We invite interested local officials to contact us for assistance in beginning the pre-requisite inventory and assessment. ■

Walking in a bog, you almost expect to see some prehistoric animal emerge from the ooze.

A Trip to a Bog

by Gale W. Carter
Drawings by Caryn Alleva

There is a certain primordial atmosphere about a bog. I almost expect to see some prehistoric animal emerge from the ooze. When I go bogging, nothing quite like this happens, but in spite of this I find bogs fascinating places to explore. They are filled with many plant species. There are unusual looking plants, like the pitcher plant, sundew, and bladderwort. There may be thousands of sundew plants in a single large northern bog. These carnivorous plants all have special devices for catching organisms to supplement their nitrogen supply. Some bogs have beautiful orchids, like the rose pogonia (Pogonia ophioglossoides) and grass pink (Calopogon pulchellus).

Pitcher-plant (Sarracenia purpurea)

Specially-adapted Plants

Plants typical of a bog have many of the same characteristics found in desert and seashore plants. They are physiologically dry, even though they are found in a wet environment. The cool temperature in bogs makes it more difficult for plants to absorb from their roots, and sphagnum moss, which is often the dominant plant in a bog, takes in so much water that it leaves little for other plants. Because bog plants have difficulty obtaining water and nutrients, they have many structural adaptations to compensate for this.

Four of the most common plants found in bogs are leatherleaf (Chamaedaphne calycutata), bog laurel (Kalmia polifolia), Labrador tea (Ledum groenlandicum) and bog rosemary (Andromeda glaucophylla). These are all evergreen shrubs. Being evergreen is crucial in an environment where there are cold winters and harsh winds. It makes it much easier to get a start in the spring without having to produce new leaves.

Another adaptation is the ability of these plants to

tolerate a wide range of temperature between the roots and the upper leaves. Some of these plants blossom even when their roots are encased in ice.

Similar Patterns

Bogs are inland-wetland areas that usually develop in depressions with poor drainage. Many form in lakes that were originally kettle holes. This is why there are many bogs in Canada and northern portions of the United States. Bogs become smaller and less frequent as we approach the margin of the glaciers' former advance.

Bogs are low in the number of plant nutrients they possess. Oxygen is lacking and, because decay is slow, plant life is not easily recycled. Where sphagnum is present, the water is very acid, made so by the chemical action of the sphagnum.

Bogs all have somewhat similar patterns of vegetation and they all go through similar stages of maturation, but there are still many variations. This is particularly true if we compare northern bogs with those in other parts of the country.

The Evolution of a Bog

Typically, bogs start out as open water of lakes or ponds, with vegetation in the form of sphagnum moss and sedges. Eventually, a bog mat forms which becomes covered with low-growing evergreen shrubs, such as bog laurel, leatherleaf, bog rosemary, and Labrador tea. Bogs may not have all of these shrubs, but they will have some of them. These are all shrubs that cannot tolerate very wet conditions. They cause the mat to thicken over time. The dominant plant in the group is usually leatherleaf. Labrador tea tends to be the dominant shrub when leatherleaf is not part of the mat.

Along the outer rim of the bog mat are plants such a buckbean (Menyanthes trifoliata), which spreads its underground rootstalk, and swamp loosestrife (Decadon verticillata), which arches over the water and grows new shoots at the tips of its branches. This helps to fill in the lake. In this part of the lake, wild calla (Calla palustris) may also grow. The open water beyond may contain species of pondweed (Potomogeton sp.) and water lilies (Nymphea sp. and Nuphar sp.) as well as species of bladderwort (Utricularia sp.).

Eventually, the center of the lake may fill in and coniferous trees such as tamarack (Larix laricina) and black spruce (Picea mariana) invade from around the edges. Dwarf birch (Betula pumila) may also be present. These trees may fill the basin or depression completely as the bog becomes thick and heavy enough to reach the bottom. At this time the open bog has become a bog forest.

When a lake becomes completely filled in with sphagnum, it is called a muskeg. This is an Indian word originally meaning the rounded tussocks of sphagnum created by the pressure of the filled-in bog.

"Don't go in alone."

Exploring a bog mat can be an exciting experience, but because there may be holes in the bog mat, it is important not to go alone. A group is probably best because slipping into a hole in the bog mat can be a scary experience. My experience has been that it is more frightening than dangerous.

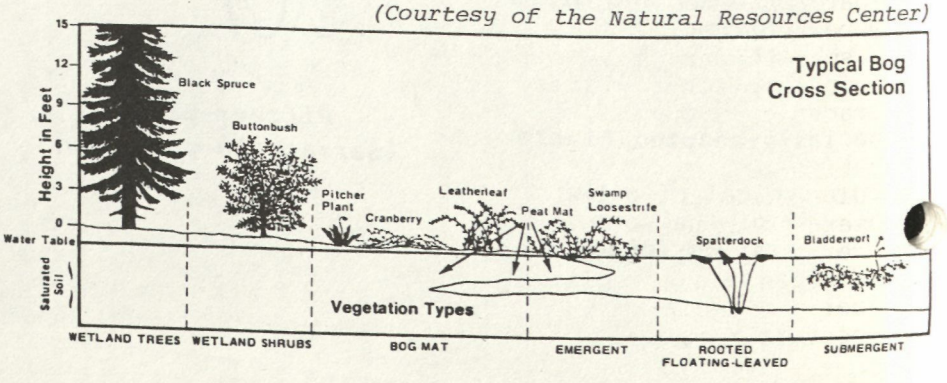
Some bogs may have poison sumac growing around them. One of my first bog experiences was a walk through what seemed like miles of poison sumac. It was early spring and the snow was still on the ground. We were all wearing coats and gloves. The result was that no one was affected.

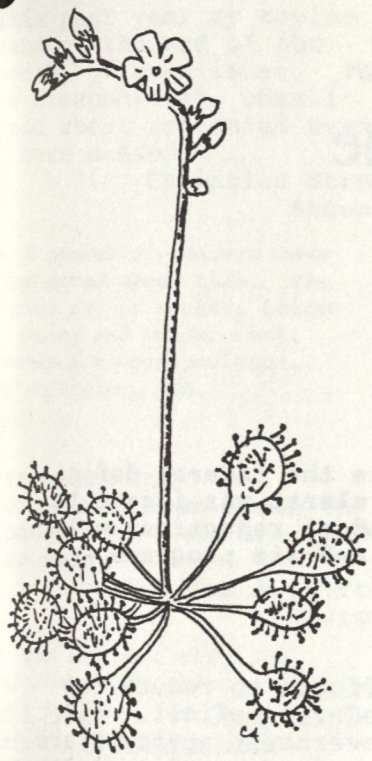
Southern New England Bogs

We will be taking a trip to two southern New England bogs and will be thinking how these bogs differ from northern bogs. The first bog is only about two miles from where I live, the suburb of a small city.

On the outer edges of the first bog are many typical wetland plants, such as cinnamon fern (Osmunda cinnamomea), spice bush (Lindera benzoin), sweet pepperbush (Clethra

(Courtesy of the Natural Resources Center)





Round-leaved sundew (Drosera rotundifolia)

alnifolia), high bush blueberry (Vaccinium corymbosum) and swamp honeysuckle (Rhododendron viscosum). Other plants, growing farther back on somewhat drier land, are red maple (Acer rubrum), white pine (Pinus strobus), shadbush (Amelanchier sp.), meadow sweet (Spiraea latifolia), wild sarsaparilla (Aralia nudicaulis) and starflower (Trientalis borealis).

Farther out on the sphagnum bog mat is a dense cover of leatherleaf (Chamaedaphne calyculata), chokeberry (Aronia sp.), some small tamarack (Larix laricinn), pitcher plants (Sarracenia purpurea), sheep laurel (Kalmia angustifolia), spatulate-leaved sundew (Drosera intermedia), large cranberry (Vaccinium macrocarpon), and small cranberry (Vaccinium oxycoccos).

In the center of the bog where there is still water, there is horned bladderwort (Utricularia cornuta), sweet white water lily (Nymphaea odorata), cotton grass (Eriophorum virginicum), a sedge, and a number of species of rushes.

The second bog in a nearby town will offer a comparison of two southern bogs. This is a black spruce bog which developed in a glacial kettle. New plant species here are rhodera (Rhododendron Canadense), pale laurel (Kalmia polifolia), and creeping snowberry (Gaultheria hispidula). There are no sundews. The two tree species are black spruce (Picea mariana) and tamarack (Larix laricina). There are no orchids present in either bog. This second bog is pretty well filled in. A great many stunted black spruce have taken over and are the dominant species.

Bogs in southern New England are smaller and fewer in number because there are not as many spots where the climate is cool and moist enough for bogs to develop.

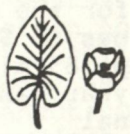
Some of the plants that are often present in northern bogs may or may not be present in southern bogs. Plants like Labrador tea are at the lower limit of their range and may be missing in some bogs. Bog rosemary is also common in some bogs but not present in others. Black spruce and tamarack may be more scattered in some southern bogs and in some cases are replaced by Atlantic white cedar (Chamaecyparis thyoides).

The Value of the Bogs

Bogs have many values. One is as areas for scientific study because of the unusual physical conditions and unique plants. Pollen studies of bogs have revealed important information on changes in vegetation and climate over the years. Research is being carried out to determine the value of bogs as wildlife habitats.

For many years, man has taken advantage of bogs for raising cranberries (Vaccininium macrocarpon). The water level of bogs is manipulated to make crops of cranberries more productive. Bogs are also valuable wetlands which act as a sponge to hold back water.

Bogs are fascinating places to visit, not only because of the many unusual and often unique plants found there, but because of the experience itself. You must not be timid about sinking up to your ankles, and sometimes deeper, in mud or water. Heat and humidity accompany you in your exploration; sometimes pesky insects, too. Despite these drawbacks, I feel sure that a visit will be well worth your while. ■



A Few Changes in the 1987 EPA Budget

by Leslie Lewis,
Citizens' Participation Coordinator

As I am sure you are aware, the Gramm-Rudman-Hillings bill is sending shock waves through the entire federal budget-making process. Environmental programs will not be spared in the effort to reduce the federal deficit. The following release was issued to describe how budget reductions will affect the EPA and its programs.

U.S. Environmental Protection Agency Administrator Lee M. Thomas recently announced that President Reagan has proposed a fiscal 1987 budget of $2.4 billion, which represents one of the more stable funding levels in the domestic federal budget.

The president is requesting 13,161 work-years to support his budget, which repesents a decrease of less than two percent from the fiscal 1986 budget. The $2.4 billion, however, is an increase of six percent over the previous year's dollars. Some of the specific increases and decreases include:

- Funding for the Superfund program grows to $1.5 billion, up 189 million from last year, assuming Congressional re-authorization.

- Funding for EPA's operating programs decreases by four percent to $1.4 billion, down $50 million from 1986.

- The president is asking for an increase of $18 million for EPA's Hazardous Waste managment program over the current estimate. This represents an eight percent increase over last year.

- EPA's acid rain research program increases by 13 percent to $55 million, up $6.4 million from 1986.

- Funding for EPA's enforcement program increases slightly to $130 million, a $1 million increase over last year.

- EPA's research and development budget is reduced by six percent to $295 million.

- EPA's support for the Chesapeake Bay cleanup continues at $10 million.

Under the proposed budget, EPA would support a strong partnership with state and local governments through a total of $270 million for grant assistance programs.

Thomas pointed out that the budget takes into account Administration efforts to reduce the federal deficit. All government agencies are expected to share in the 4.3 percent program reductions.

Thomas said, "While the total grant levels are reduced slightly, we believe that program impacts can be kept to a minimum. We intend to work with the states in helping to develop reasonable systems that will increase revenues to offset our proposed reductions."

The president's budget does not include resources for EPA's Construction Grant (sewage treatment plant) at this time. An amended request for $118 billion will be submitted after appropriate legislation is enacted. The program is designed to be phased out by 1990.

In conclusion, Thomas said, the EPA has "invested a great deal of time, energy, and analysis to produce a solid action plan that . . . will provide sufficient resources for us to do our job of protecting human health and the environment." ■

Letters to the Editor

This past year my copies came at the end of the month, or even later. This is disappointing when I read about scheduled events I have missed.

Christina Strode
Ansonia

■ *A number of readers have complained about this. The answer is, of course, better planning and harder work. Thanks for your patience. We're trying. Ed.*

Are there any non-mountainous areas in Connecticut that are good for walks?

William A. Wirtes
Newtown

■ *The best bet for this information is the Connecticut Walk Book and the Connecticut Outdoor Recreation Guide. For current price list, other publications, and information on membership, write Connecticut Forest and Park Association, Meriden Road, Middletown, CT, 06457, or call 203/346-CFPA.*
Ed.

I would like you to know that members of the Connecticut State Society in Florida, Connecticut people who have moved permanently or for the winter to Florida, all enjoy the Bulletin very much.

Andrew F. Weick
Treasure Island, Florida

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities, and employment opportunities without regard to race, color, religion, age, sex, physical or mental disability, national origin, ancestry, marital status, or political beliefs."

I am in charge of the plaster of paris castings of the original Eubrontes prints at Dinosaur State Park. I have met families from a lot of countries around the world, here just to make these casts. I have also met people here from all over the U.S., but I can count the visitors from Connecticut on the three toes of single print from Eubrontes. Connecticut people, please come to your Dinosaur Park. Come say "Hello" to the statue of Dilophosaurus that I keep dusting off in preparation for your visit.

John T. Dolloff
Rocky Hill

I agree that it was nice to see the conservation officers on the job and appreciated. But would more of them be an improvement? Lobstering season is approaching, and the regular poachers, gear molesters, and thieves will be at it as usual. Arrests are useless if the courts do not enforce the laws and issue adequate sentences. Are not the conservation officers "Officers of the Court?" Are they non-vocal because their superiors will not allow them to be otherwise? Allowing flagrant violators to continue fishing while their cases are on appeal and then giving them a slap on the wrist is only an incentive to continue in their illegal ways.

C.H. Letourneau
New Haven

■ *Robert Buyak, Acting Director, Bureau of Law Enforcement, replies:*

Any increase in the number of conservation officers would improve law enforcement by increasing the number of patrols, which would in turn increase the number of contacts and arrests. Although law enforcement efforts are difficult to measure, it is a known fact that increased patrols and arrests act as a deterrent to wildlife violations.

It is the conservation officers' job to make arrests, and the duty of the Court to determine if prosecution is appropriate. The conservation officers have been and will continue to be vocal in defending their cases in court with the backing of their superiors, provided the circumstances justify such actions. Our conviction rate is currently running about 81 percent.

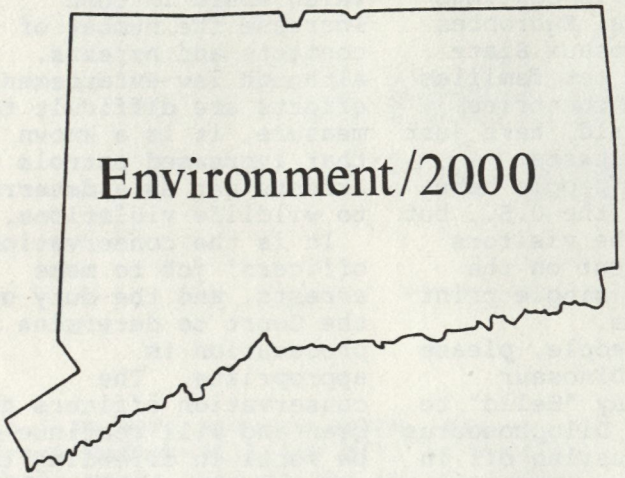
You mention allowing violators to continue fishing while their cases are on appeal. This is allowed by law. Remember, a person is innocent until proven guilty in a court of law. ■

Endnote

"Shad, bass, and salmon more than half sustain the province. From the number of seines employed to catch fish passing up the locks, one might be led to suppose that the whole must be stopped. Yet, in six months time, they return to the sea in such multitudes of young ones as to fill the Connecticut River for many days, and no finite being can number them."

Samuel A. Peters
History of Connecticut
1783

Next month's Bulletin



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